The following is a copy of another telegram to the *New York Herald*:—

"*Wladiwostok, Siberia, Dec.* 9 (10.10 M.E.).—Prof. Hall reports much haze and cloud at Wladiwostok. First and second contact of Venus observed, and thirteen photographs taken near middle of transit. A calm bay, with temperature 34°; instruments and photographic apparatus working finely. All the American party working well."

The Russian and Austrian parties give no details; they only announce their success.

There is now a certainty that in the Southern Hemisphere the eastern stations will be more strongly occupied than the western ones. The Americans were foiled in their gallant attempt to occupy the Crozets, because they had not time to wait for weather moderate enough for them to land their instruments. The party has therefore gone on to Campbell Island, where they will already find a French party. It is difficult to restrain one's pen when we think of the combination of want of a true appreciation of the conditions of the problem, and want of that old spirit which used to make us take up posts of difficulty, which has prevented England being represented here. A successful Polar Expedition will scarcely wipe away the national disgrace which is ours in consequence of official action in this matter, and the French and Americans may well be proud of the position they now occupy.

The *Times* thus relates the French landing on Campbell Island:—

"A letter has been received to-day (Dec. 11), dated Campbell Island, Oct. 4, from the chief of the French Expedition stationed there. This had been carried to Bourbon by the ship which had transported the expedition to Campbell Island, and which left it to wait at Bourbon until the time came for fetching the astronomers away. The first idea was to keep this ship off the coast of Campbell Island in order that the observers might live on board; after struggling three days against horrible weather they at last landed on the island, and they soon perceived that it was impossible to keep the ship off the shore, which was without shelter and exposed to terrible gusts of wind, so that it ran the greatest risk of being lost. The members of the expedition, seeing that if the ship were to go down they were exposed to very serious danger—for they would be abandoned on an uninhabited island without means of communication, while everybody would think they still had the ship at their disposal—decided to unload the ship and establish themselves in the island and to send away the vessel, which would come and fetch them immediately after the observation of the phenomenon. This project was carried out. The observers began by organising temporary shelter, and then they built sheds to protect the instruments, the necessary utensils, and the provisions. The process of unloading was very long and troublesome, because the expedition, which has many members, had brought provisions for one year. While exploring the island they found nearly in the middle of the island a vessel which a hurricane had thrown there, and they were thinking of utilising the wreck, either by splitting it up or by placing themselves inside it, for protection against wind and weather. But two or three days afterwards another hurricane blew the ship out to sea, and they saw it no more. They were then obliged to do the best with all they had brought with them, for they were living in hourly dread of sharing the fate of the wreck.

"It is thought that since the 4th of October, the date on which the ship left for Bourbon, up to the moment of the transit, the expedition will have completed its organisation, its observatories, and have been able to fulfil its mission. As soon as the ship reaches a telegraphic station, the expedition will hasten to communicate particulars to the Institute of France. Nothing is known, of course, as to the exact period when these communications will be received. The particulars relative to the difficulties of this expedition and the dangers to which it is exposed have been received here with all the more interest that it was feared only two days ago that the Campbell Island station would not be organised in such a way as to make the observations under favourable conditions. It is still feared the weather may not have been favourable, and that so much fatigue and effort may not have been rewarded with the magnificent result it deserves."

It will be seen not only that a large number of observations have been made bearing on the main point, but that many side issues of great interest are raised. Dr. Janssen's observations have decidedly been amongst the most remarkable, not only with regard to the absence of the ligament, but as touching the visibility of Venus on the coronal atmosphere. Any detailed reference to these and many other points we must, however, leave for a subsequent article. We have been anxious in the present one to put our readers in possession of the results of the observations, so far as we at present know them, in the most authentic and intelligible form.

CHAPPELL'S "HISTORY OF MUSIC"

The History of Music. Vol. I. From the Earliest Records to the Fall of the Roman Empire. By William Chappell, F.S.A. (London: Chappell and Co., 1874.)

MUSIC is now being cultivated in a much more earnest and thorough manner than heretofore, not only as a practical art, but as a matter of theoretical and historical interest, as is evidenced by the late formation of a "Society for the study of the Art and Science of Music," the object of which is to encourage musical studies of a higher character than those comprised in ordinary musical training. Hence, as the early history of music is one of the most interesting as well as one of the most obscure topics connected with the art, an authoritative new investigation like that before us is of real value.

Mr. Chappell, who has had much to do during his life with practical music, brought out some years ago a "History of the Ballad Literature and Popular Music of the Olden Time," a book which has become now of standard authority on such matters. It seems that the eminent historian Mr. Grote suggested to him that he would do well to carry his inquiries further back, and to attempt to unravel the state of music among the Greeks. His account of his progress is worth extracting. He says:—

"Mr. Grote's enthusiasm for the Greeks somewhat exceeded mine; and, although my recollection of the language was fresher than now, I did not suppose that, even if I should succeed, a knowledge of Greek art and science would greatly advance those of the moderns; therefore I received the proposal rather lukewarmly. But when favoured with the twelfth and last volume of the 'History of Greece,' with an inscription from the illustrious author, in deference to his long antecedent recommendation I took the first step forward, by buying the works of the Greek writers upon music.

"I had taken note of the odd uses of Greek words in manuscripts of the Middle Ages written in Latin; there-

fore, while reading the Greek authors on music, I continued to copy out such definitions of musical terms as I then encountered. I began without expectation of success as to understanding the music of the Greeks, owing to the number of able men whom it had baffled; but my little glossary seemed to afford the clue, and soon made me interested in the subject. It became evident that the Roman perversion of Greek musical terms had been one of the great difficulties in the way of previous inquirers (although by no means the only one), for I could then understand the system."

All this confirms the character of the author as an earnest, painstaking inquirer, and affords therefore a guarantee for the value of his historical investigations.

Mr. Chappell comments on the two great English musical histories of the last century by Burney and Hawkins, and contends that much of the obscurity in which they left the ancient music was caused by their obtaining their information second-hand, namely, from Boëthius and other commentators, chiefly Latin, on the Greek writers. Many of these had not sufficient knowledge of the subject to understand the original technical terms, which they therefore rendered either erroneously or obscurely, and thus error and obscurity have been introduced into succeeding writings.

"It may," says Mr. Chappell, "at first appear unaccountable that, among the numbers of learned men who made the attempt to understand the Greek system during so many ages, no one should have succeeded, especially considering that it would hereafter be shown, even to the quarter-tone, to be our modern system of music. So simple a result seems ludicrous. But this general failure is to be accounted for by the fact that the Romans had twisted round the meanings of the Greek words in so extraordinary a fashion that perhaps 'tone' and 'diatonic' are the only two which remain nearly identical in the two languages. So that, to unriddle the subject, the student had first to unlearn all that he had been taught as to the meanings of musical terms, and then to begin again, trusting only to the Greek authors. No Latin treatise would avail, nor would any modern language in which musical terms had been derived through the Latin, or through the Western Church. The misuse of Greek technical language by Romans was by no means limited to music."

To eliminate these errors, the author tells us, and we believe him, that he has in every case, where possible, gone to the fountain head, and that the information he gives us may consequently be depended on.

We have thought it right to show at some length what are the author's qualifications for his work, and on what grounds he lays claim to our attention and credence; for, in *historical* works this is all-important; few of us have opportunity, and still fewer have inclination, to grope for ourselves among the mouldy lore of antiquity; we are glad enough to find others who will do it for us, and are ever ready to take as authentic whatever they tell us they have found there. Hence correctness and care are cardinal virtues in historical works; the want of these qualities renders such works worse than valueless, as merely promoting the dissemination of error.

The history of music, interesting as it is, is not, properly speaking, a subject to be treated of largely in NATURE; but, in justice to the meritorious author, we may venture to mention some of the results of his labours.

In the first place, he shows that the system of music used by the Greeks did not originate with them, but was borrowed from more ancient nations. He finds, for example, that "the number of notes in the Egyptian scale was precisely the same as the Greek, including the three Greek scales, diatonic, enharmonic, and chromatic." No Greek writer alludes to any difference between the Egyptian and Greek systems of music, although the best Greek works on the science of music, saving the Problems of Aristotle, were written on the soil of Egypt." Then he turns to the Chaldæans, or learned men of Babylon, and again finds (through an astronomical comment which, as usual, supposes the motion of the planets to be regulated by musical intervals, and thus to make everlasting harmony) that the Chaldæans had the same musical intervals of fourth, fifth, and octave, as the Egyptians. From these he was led to Hebrew music; remarking that proofs are not wanting of the similarity of this to the music of surrounding nations; so that "henceforth we may fairly conclude that we have at last arrived at the musical system of ancient Asia, and that it is our A, B, C, D, E, F, G."

The author, of course, enters largely into the progress of music in Greece. We read of the early tetrachord lyre, of its enlargement by Terpander; of the great improvements made by Pythagoras in the addition of the octave, the fifth, and other notes; of his important determination of the proportions of the lengths of strings, subsequently transmitted to posterity by the great geometer Euclid; of the chromatic and enharmonic scales, hitherto so perplexing; of the improvements in certain harmonic ratios made by Didymus and Ptolemy, and so on; from all which we undoubtedly gather a far clearer view of what Greek music was than can be obtained from either of our English histories.

The result is that the ancients anticipated almost exactly the diatonic scale of modern times. Their scale passed over to the Latins; it was adopted without change by the early Church; and by this means it has come down, unaltered, to our time. If we run up two octaves on the *white* keys of the modern piano, beginning and ending with A, we are playing the same notes as the Greeks used, any time after Pythagoras. We may add that if we use only the *black* keys (and many modern tunes may be thus played), we sound a scale precisely corresponding to one of the Greek "chromatic" genera.

The scale, be it remembered, is the *material* from which music is made. To discover what sort of melodies the ancients constructed from this material is another thing. Mr. Chappell has, however, presented us with three real Greek tunes, set to hymns to Calliope, Apollo, and Nemesis respectively. They have been, it is true, decked out, by the skilful aid of Mr. Macfarren, in an anachronous dress of modern harmony and rhythm, suggesting the idea of Pythagoras in a periwig; but, at any rate, they are no more incongruous in this respect than the so-called "Gregorian" chants, as sung with modern embellishments at a Ritualistic church-service.

The question has been often and warmly discussed whether the ancients used what we call harmony, or whether they did anything analogous to our singing or playing in several parts. Our author believes that they did, but in this matter he has not the argument all his own way. The late M. Fétis, who devoted the last

years of his life to the preparation of a great History of Music,* has made a most elaborate investigation of this point, partly in the third volume of his work, and still more fully in a separate memoir published by the Academy of Sciences of Brussels. It is ably and forcibly argued, in opposition to many learned German critics who have held Mr. Chappell's view, and M. Fétis arrives at the conviction that "the supposition of the existence of harmony among ancient nations is one of the most remarkable extravagances of modern times." Mr. Chappell is very positive in his own opinion, but when we come to compare the two essays we cannot help seeing what a poor match his desultory guerilla argumentation is for the powerful disciplined logic of his more experienced antagonist, and cannot hesitate for a moment which side should prevail.

But even if we were inclined to believe with our author that the ancient Greeks did use some sort of harmony (other than the octave, which M. Fétis freely allows them in common with all nations), we are not much the forwarder: for even Mr. Chappell appears quite at a loss to form any reasonable idea of what this harmony was like. After all, therefore, the dispute is little more than "'twixt tweedle-dum and tweedle-dee."

The subject of ancient *musical instruments* is as important and as interesting as that of the music itself: and, indeed, they have in all ages had such a necessary connection, and have been so dependent on each other, that improvement in one has gone hand in hand with improvement in the other.

Mr. Chappell has devoted much attention to the evidence as to the nature of the instruments used in ancient times. This, he says, has always been found a difficult subject to treat upon, partly because so few of the instruments named by classical writers can be identified by pictorial or written descriptions, and partly because such descriptions, when they do exist, are often obscure or contradictory, particularly when obtained only through the medium of incorrect translations. He goes through a long list of ancient instruments of the three classes—wind, percussion, and string—and has given a large fund of information about them.

But what he prides himself most upon is the elucidation of the construction of the hydraulic organ, about which there has hitherto been much doubt and difficulty. He shows that this has arisen either from misapprehension of the ancient descriptions or from a want of sufficient knowledge of mechanism to understand the technical details; and he gives, in a most interesting chapter, an account of the instrument, which evidently presents a high claim to be the true one. In this particular we are delighted to award him the merit of a real triumph over his enemy, M. Fétis, who says, after speaking of the ambiguity of the description of the instrument left by Vitruvius:

"Sous ce rapport l'incertitude persiste, et tout porte à croire qu'elle ne sera jamais dissipée, à moins que le hasard ne fasse découvrir un des instruments du mécanicien d'Alexandrie, dans les recherches faites à Pompeii."

* "Histoire générale de la Musique, depuis les temps les plus anciens jusqu'a nos jours." Par F. J. Fetis. Paris: Firmin Didot. Four volumes of this are now ready, bringing the history down to somewhat later than the time of Guido d'Arezzo; and, we understand, materials have been left for still more.

If it were only for his solution of this difficulty, Mr. Chappell's work deserves high praise.

We cannot expect every historian to be a Gibbon or a Hume, and though we readily testify to the merits of Mr. Chappell's work, we are obliged to say it is not without its faults. One is the tendency of the author to be diffuse and discursive in his style, to such an extent, indeed, as to give the work the character rather of an amusing gossip than of a serious history.

Another of Mr. Chappell's peculiarities is his strong tendency to over-confident dogmatic assertion, which renders it often difficult for the reader to distinguish between statements he has evidence for, and mere opinions of his own. Every writer on history should remember that on that subject dogmatism is utterly out of place: no man's *ipse dixit* is worth the paper it is written on: if he cannot or will not show chapter and verse for all he has to say, he had better let history alone. Hypotheses and speculations on obscure points are all very well; they are often useful for discussion, and sometimes turn out right; but they must be put forward clearly as what they are, and not given as truths.

Mr. Chappell has a high opinion of his own qualifications for his work, which is quite pardonable; but this is unfortunately coupled with an unduly low estimate of the competency of other historians, which is not pardonable. His contemptuous sneers at M. Fétis, for example, are in the worst taste; and if the Nestor of musical literature were alive to reply, we would not be in Mr. Chappell's shoes for a trifle. As it is, did it never occur to him that, as M. Fétis's history has now a wide circulation, and is becoming, in fact, the European standard book on the subject, readers who have access to both works might be tempted to retaliate by comparisons not altogether in favour of the English historian? Those who live in glass houses should not throw stones.

We have alluded above to an anachronism in the form in which Mr. Chappell has presented some of the Greek tunes. There are other analogous cases where he produces confusion by ascribing to the ancients ideas that have only arisen in modern times. He talks, for instance, often of the *key* and the *key-note* of Greek music. Does he mean to assert that any ideas existed in those days analogous to what we understand by these terms now? And when he sees, in an ancient picture, a man shown clapping his hands, he calls him a "conductor beating time." Had Sir Michael Costa really a prototype among the Egyptians, who gesticulated four in a bar?

We wish we had no worse faults to find than these, which are, after all, only peculiarities of style (and *le style c'est l'homme*); but unfortunately there is one part of the work which, as it affects the interests which it is the peculiar object of NATURE to promote, we are bound, though most reluctantly, to speak strongly on. The followers of Zoroaster hold that every man is subject to the alternate influence of two spiritual agencies, one prompting him to good, the other inciting him to evil. Ormuzd (we think that is the name) has been active with Mr. Chappell, leading him through the pleasant pages of Aristotle and Plato, and dictating to him all the agreeable matter in which we have been delighting, while the serpent-like Ahriman has been looking grimly on. But, the

history ended, the turn of the evil tempter has arrived, and the good angel has retired, veiling his face with his wing, and dropping (if angels can weep) a tear over the calamity which he had no longer power to avert.

In plain language, Mr. Chappell has been minded, in an evil hour, to wander away from his legitimate domain of Ancient History, and to indite a long disquisition on the by no means kindred subject of Modern Science, treating especially on the laws and phenomena of acoustics, and their bearing on the nature and relations of musical sounds. In this his aggressive spirit is again manifested. All scientific men interested in the theory of music know that within the last few years Prof. Helmholtz, of Heidelberg, one of the first physicists of Europe, has brought out a work, "Die Lehre von den Tonempfindungen, als Physiologische Grundlage für die Theorie der Musik," which, for the profundity of its knowledge both of the physical and musical elements of the question; for the novelty and importance of its views; for the skill and conclusiveness of its experimental demonstrations; and for its general masterly style, has deservedly excited the admiration of all Europe. It has gone through three editions in Germany, has been also published in French, is now being translated into English, and has served as the basis already of several other English works, the author of one of which describes it as "a profound and exhaustive treatise, which does for acoustics what the Principia of Newton did for astronomy." Now, Mr. Chappell presumes to criticise this work in a tone which clearly shows not only that he is unaware of the reputation of its author, but that he is under some strange hallucination as to his own qualifications for setting up as judge in the matter. He attributes to Helmholtz both theoretical ignorance and experimental error; puts forward his own confused notions as "the *true* (in offensive opposition to Helmholtz's *false*) physiological basis for the science of music;" and sums up with the following paragraph, which, comparing the scientific position of the two writers, may certainly be considered a curiosity of criticism:—

"I am persuaded that the *Tonempfindungen* is a hasty book . . . . the value of time was too largely considered in its composition, and some very necessary experiments, such as those upon harmonics, were omitted. But since success has been so widely attained, it may be hoped that the author will find time to revise the next edition, and, in doing so, that he will bear in mind an admirable motto for men of science, *Chi va sano, va piano.*"

A HASTY BOOK!—why, its very first sentence states that it is the result of *eight years' labour!* Experiments on harmonics omitted!—why, they form the substance of the entire book, from beginning to end! From these, and many other misapprehensions of Mr. Chappell's, we are led to doubt whether he can even have read the great work he ventures so freely to criticise.

Prof. Helmholtz has always maintained cordial relations with this country, and in the name of English science we think we owe him an apology that anything like this should have appeared in our language under a quasi-scientific guise. He will, however, know that historians may rush in where philosophers would fear to tread, and we need hardly assure him that no English scientific man, competent to judge of his work, would be in the least likely to endorse Mr. Chappell's criticisms.

We lament Mr. Chappell's mistake on another ground. Practical musicians have generally but little knowledge of the scientific data on which their art depends; such information is never taught in England to professional students as any part of their musical education; it is studied almost exclusively by men of science and amateurs. All right-minded persons would gladly desire to promote the wider spread of knowledge of this kind; but we cannot but feel that when a practical musician takes it into his head to attack scientific authorities who are universally respected, and scientific doctrines which are universally established, a great obstacle is thrown in the way of that cordial sympathy and co-operation which ought to exist between the two classes. On the one hand, the scientific man will be angry at the perverse unteachableness of the musician; while, on the other hand, the musician, who may easily mistake error for truth, will be set against the theorist and be more disinclined than ever to receive information from him.

It would be an ungracious task to point out in detail Mr. Chappell's errors; we would rather recommend him, instead of waiting for Prof. Helmholtz to "revise his next edition," to read the work as it is, more thoroughly and carefully, and with more respect for the character of its author. And in the meantime, out of sincere good will, we earnestly advise him to expunge all this irrelevant matter; it not only damages his valuable book, but, what is worse for him, it tends to engender in the minds of the best class of readers a want of confidence in his judgment and accuracy as regards other things.

FOSTER AND BALFOUR'S "EMBRYOLOGY"

The Elements of Embryology. By M. Foster, M.A., F.R.S. and Francis M. Balfour, B.A. Part I. (London: Macmillan and Co., 1874.)

"STEP by step the simple two-layered blastoderm [of the hen's egg] is converted into the complicated organism of the chick." The separate cells of which it is originally composed have, to all appearances, the most uncomplicated relations one to another; nevertheless, in accordance with laws of which we have not the least conception, under the influence of slight external warmth, by a series of fissures, inflections, and developments in special directions, they convert the store of albuminous material that, together with them, is included within the egg-shell, into an organism so elaborate as a fully developed bird, which can run about and feed itself immediately it makes its appearance in the theatre of active life. The physicist, thoroughly acquainted as he may be with all the principles of statics, dynamics, heat, light, and electricity, finds himself quite at a loss to explain or to predict any single one of the numerous changes which have taken or will take place in this blastodermic membrane during any period, however short, that it has been the subject of observation. Neither the chemist nor the physiologist will find himself in any more advantageous position, except that the latter, from previous experience, will be able to state dogmatically the succession of the steps of the developmental process. We group these phenomena, apparently so extra-physical, under the term